

## **FINAL MEETING SUMMARY**

### **HANFORD ADVISORY BOARD RIVER AND PLATEAU COMMITTEE**

*June 11, 2013*

*Richland, WA*

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<p>This is only a summary of issues and actions in this meeting. It may not fully represent the ideas discussed or opinions given. Examination of this document cannot equal or replace attendance and public participation.</p>
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### **Opening**

Dale Engstrom, River and Plateau Committee (RAP) vice-chair, welcomed the committee and introductions were made. Regarding the May meeting summary, several edits were received on the section regarding the 300 Area Remedial Investigation/Feasibility Study (RI/FS). More clarification had been requested on the monitored natural attenuation (MNA) approach and a footnote was added to clarify an incorrect statement made during the meeting. The committee approved the May meeting summary.

### **Update on Orchard Lands Operable Unit Work Plan\***

#### *Agency presentation*

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\* Please see Attachment 1 – Transcribed Flip Chart Notes for key points/follow up actions recorded during the committee discussion.

John Sands, U.S. Department of Energy – Richland Operations Office (DOE-RL), provided a presentation on pre-Hanford orchard lands and the decision to have a separate Operable Unit (OU) for the orchard lands (Attachment 2). John outlined the RI sampling approach for the orchard lands as defined in the OU. During his presentation, John noted the following points:

- There are 5000 acres of potential orchard lands, defined by pre-Hanford orchards in the River Corridor. A major component of the RI is to refine and determine the location of orchard lands using Geographic Information Systems (GIS).
- The RI sampling strategy involves dividing the 5000 acres into 69 decision units that will each have 29 samples per unit that will be analyzed for arsenic and lead. These 29 samples include three quality assurance samples. This work plan was transmitted to the U.S. Environmental Protection Agency (EPA) and Washington State Department of Ecology (Ecology) in April 2013.
- Arsenic and lead do not migrate very far or very deep in the soil.

#### *Regulator perspectives*

Chris Guzzetti, EPA, said the Orchard Lands OU is different from other OUs in that EPA and Ecology are co-leads whereas the usual approach is for one agency to take the lead role. This co-lead approach is a result of the extensive area covered by the orchard lands. Both agencies are commenting on the work plan and will be involved with efforts going forward. Chris said EPA is starting to prepare initial comments and have only recently received the work plan. EPA will follow the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process.

Nina Menard, Ecology, said Pacific Northwest National Laboratory (PNNL) and DOE are taking a good approach towards addressing a very large issue. Ecology is also examining the work plan, including the methods that will be used for sampling. Nina said Ecology hopes to resolve many of the issues before official comments are provided to DOE.

#### *Committee discussion*

*Note: This section reflects individual questions, comments, and agency responses, as well as a synthesis where there were similar questions or comments. Questions, comments, and responses were provided by HAB members unless noted otherwise.*

Q. DOE's presentation focused on characterization; where does remediation come in?

*R. [Ecology] Following the CERCLA process, the first step is to examine the extent of the contamination and then consider feasible options for addressing this contamination. Characterization is still ongoing under the work plan, which will ultimately define the types of remediation that might be possible and how effective that remediation will be.*

Q. The extent of the problem is surprising. Does the contamination really extend over 5000 acres?

*R. [Ecology] The actual extent of the orchards lands is being determined as part of characterization in the RI.*

Q. What was the reason for selecting 29 samples per unit? DOE appears to have focused characterization on those areas where the agency believes contamination may exist without considering areas outside that range. DOE should include samples from areas not believed to be contaminated to be conservative and confirm assumptions about the extent of the orchard land contamination.

*R. [DOE] The current sampling design of 26 samples plus three quality assurance samples for each decision unit follows statistical design standards. Discussions are ongoing in work plan development as to whether sampling should go beyond statistical sampling approaches.*

C. The Benton County Commissioners have questioned what precedent would be set if the Hanford Site requires a set level of arsenic cleanup. Would all farmers in Benton County be expected to meet the same expectations set at the Hanford Site? Decisions made could have implications for orchard lands across the country.

*R. [Ecology] Ecology has been in discussion with experts on the question of what an acceptable level of arsenic would be. The agency has drafted a memo that will be issued very soon detailing the amount of arsenic that will be considered safe from a human health standpoint. This amount would apply not only to orchard lands at the Hanford Site; the level set would also apply statewide. The new arsenic standard is expected to be 20 mg/kg.*

Q. The maps in the presentation indicate that overlap between the Orchard Lands OU and other Hanford Site OUs along the Columbia River. Will DOE sample for arsenic in the OUs outside the orchard lands? Contaminants mix together and there are likely waste sites that have not been discovered yet.

*R. [DOE] DOE will conduct confirmatory sampling in the orchard footprint to determine whether arsenic is present. Sampling will continue at lower soil levels and laterally if arsenic continues to be found.*

Q. Will DOE sample for radionuclides or other materials besides arsenic in orchard lands that are not adjacent to other OUs?

*R. [DOE] Lead and arsenic will be the only materials sampled for under the Orchard Lands OU. DOE determined that the orchard lands should be handled completely separately from all other Hanford Site cleanup efforts.*

C. The farming history in the region prior to Hanford Site operations should be written and preserved as DOE is undergoing characterization. Irrigation systems are particularly interesting.

*R. [DOE] Prior to beginning any work at the Hanford Site, characterization is required which includes a historic review. All 5000 acres will undergo some sort of cultural review that will likely be documented.*

C. The Hanford Site is a Superfund Site; arsenic must be cleaned to whatever standard is determined acceptable. DOE does not have the option to ignore orchard land contamination over concerns about possible political implications because of the Superfund designation.

C. Contamination from orchard lands is an international problem. There are numerous examples both within and outside the United States where remedial actions were required to protect people from experiencing negative health effects related to orchard land contamination.

C. An acceptable level of arsenic would be in the range of 10-12 mg/kg. The level of 20 mg/kg expected to be issued by Ecology is reasonable because soil levels of 20 mg/kg arsenic would decrease to the 10-12 mg/kg range by the time the arsenic reaches the Columbia River. Most arsenic can be captured by scraping off six to eight inches of soil; the challenge is in the extent of the contamination over a possible 5000 acres. Cleaning up arsenic at the Hanford Site is achievable.

*R. [Ecology] Ecology is using the 20 mg/kg arsenic standard because that is consistent with levels in the Model Toxics Control Act (MTCA) Method A and cleanup at that level is achievable.*

C. It is important to consider the future types of farming that might be present on these past orchard lands and develop cleanup plans that would support anticipated future farming. For example, vineyards are sensitive to arsenic.

The committee will continue tracking progress on the Orchard Lands OU and requested that the agencies update RAP as appropriate. DOE-RL will provide the RI/FS work plan to Hillary Johnson, EnviroIssues, for distribution to the committee.

### **Update on 100-K West Sludge**

#### *Introduction*

Dick Smith introduced the 100-K West Sludge topic. He said that the removal and treatment of sludge has been a subject of considerable interest to the Hanford Advisory Board (Board or HAB) for many years. The project has been stalled many times because of problems with plans and processes. Dick said DOE will be presenting information on the process that will be used to remove sludge from the basin, current status of the project, and what the schedule is to remove the sludge. Dick also asked DOE to provide a chronology of the project history. He noted that completion of this project is important because the sludge is one of the few projects stalling release of the River Corridor into cleanup status.

#### *Agency presentation*

Roger Quintero, DOE-RL, provided an update on the K Basins Sludge Treatment Project (Attachment 3). He gave an overview of the K Basins Closure Project, noting that cleanup is a high priority since the sludge is highly hazardous material located near the Columbia River.

During his presentation, Roger noted the following points:

- There has been a lot of work completed in the K Basins but there is also still a lot of work remaining. Significant progress has been made in the 100-K Area from 2009-2012 using American Recovery and Reinvestment Act funding.
- Remediation of the sludge was put on hold in September 2012 because of lack of funding; other Hanford Site cleanup activities have been given higher priority.
- The sludge is difficult to work with because it contains fuel corrosion products and uranium, which makes the sludge very dense and difficult to mobilize. The sludge is also abrasive so pumping systems wear out very quickly.
- The sludge is considered transuranic (TRU) waste and can be disposed of at the Waste Treatment and Isolation Pilot Plant (WIPP). However, the Knock Out Pot (KOP) sludge cannot be sent to WIPP because it is considered to be too similar to fuel. DOE developed a process to separate the uranium from the material in order to process the KOPs differently and completed these efforts last year.
- Engineered Container Retrieval and Transport System (ECRTS) will be used in Phase I of the treatment project. Phase II will involve transporting sludge to the WIPP.
- A modified KW Basin Annex is being built to nuclear standards. Construction began in September 2012 and work was suspended due to sequestration and facility design issues when the facility was approximately 20% complete. Construction will likely resume in October 2013.
- Tri-Party Agency (TPA) Milestones regarding K Basins sludge removal are at risk. DOE officially notified EPA that M-16-175 is at risk because of sequestration impacts. If M-16-175 is not met, M-16-176 will also not be met. The modified dates of when these milestones are expected to be met should be available in the next few months.

#### *Regulator perspective*

Rod Lobos, EPA, said EPA is concerned about milestones being placed in jeopardy. Cleanup efforts for the sludge have been ongoing for a long time and the milestone is renegotiated approximately every four years. Cleanup of the sludge is a priority for EPA and the agency is frustrated with the continual reasons for why the work cannot be completed. Completion of the KOP portion is a positive step. Rod noted that this project never seems to receive the attention it should and funding is never adequate to complete the work.

#### *Committee discussion*

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C. The design changes on the facility are surprising. There should be enough knowledge about these types of facilities to have fairly consistent design standards. The contractor who was hired might not have had the background required to handle this type of work, making it a contractual problem as opposed to a design problem.

*R. [DOE] The design of the annex itself is not being changed. There were some consistency and configuration control issues with the design package. DOE is also frustrated and is working to address the problem with the contractor.*

Q. Uranium can create hydrogen. To address this issue in the KOPs, uranium was removed from other material and the remaining KOP material was treated separately. Is there a reason this procedure can't be used for the remaining K Basin sludge?

*R. [DOE] KOP sludge had much finer particulate material of less than 600 microns, making it easier to perform a separation process. Separating the uranium from K Basin sludge would not be as effective, although it might be worth investigating.*

Q. Will the Cold Vacuum Drying Facility (CVDF) remain in place so it can be used for the remaining sludge cleanup efforts if needed?

*R. [DOE] DOE does not plan to demolish the CVDF for several years. Theoretically, the CVDF would still be available but DOE does not have any current plans to use the facility. The contractor would be expected to develop a viable solution for any additional spent fuel that is discovered.*

Q. Every time a piece of waste is handled, the cost of disposal increases exponentially. Does DOE consider these costs when designing facilities that require material to be processed into containers that are then shipped to WIPP?

*R. [DOE] DOE does consider these costs and has examined a variety of scenarios under the requirements for preparing material versus direct disposal. Preparation of materials for shipment to WIPP would require construction of a bigger and more costly facility. Compliance with safety standards is also an important factor. It would be difficult to receive a waiver for any pretreatment requirements from the Nuclear Facilities Safety Board (NFSB). In-basin treatment and packaging is impractical.*

C. WIPP has a license covering operations over a certain period of time. There is concern that WIPP will no longer accept waste once it is ready for shipment from K Basin. The Board has expressed this concern in the past and wants to ensure the Hanford Site does not become the default disposal location.

C. [EPA] The K West sludge is not the only remote-handled TRU waste at the Hanford Site; it is just the first material being processed. The challenges faced in this effort might be a precursor to future efforts.

Q. Can the equipment DOE uses at K Basin be used in other areas of the Hanford Site? Will the equipment be portable?

*R. [DOE] The equipment is being used to test material and will be re-assembled in the field for use on the sludge. This approach ensures the equipment to be used is functional.*

Q. How will the engineered containers be disposed of once the materials have been removed?

*R. [DOE] The sludge removal system is designed to eliminate most of the contaminants from the engineered containers. The containers along with any remaining residual material will be left in place for disposal with the rest of the basin materials. There is set criteria for the amount of sludge that can remain. Materials will be grouted, cut, and repackaged as necessary for disposal at the Environmental Restoration Disposal Facility (ERDF).*

RAP requested additional briefings on K Basin sludge progress. DOE will provide a briefing in September after the annual baseline is complete and will provide another briefing when construction begins again, tentatively scheduled for next spring when the final design is expected to be complete and equipment procured.

### **ASCEM Capability Demonstration\***

#### *Agency presentation*

Vicky Freedman, Pacific Northwest National Laboratory (PNNL), provided a presentation on the Advanced Simulation Capability for Environmental Management (ASCEM). She reviewed the current status and Hanford Phase II demonstration results (Attachment 4). Vicky reviewed the steps involved in the BC crib demonstration. During her presentation, Vicky noted the following points:

- ASCEM is a toolset currently under development for understanding and predicting subsurface contaminant fate and transport across the Environmental Management (EM) complex. It is organized into three thrust areas: high performance computing (HPC), platform, and applications.
- ASCEM development is a team effort across five labs.
- The Phase I deliverable was complete in 2010 and Phase II was complete in 2012. ASCEM public release is expected in 2013.
- An important aspect of ASCEM is that developers are continually seeking feedback from end-users and the regulatory community in how to improve the tools. There is also regulatory oversight of ASCEM capabilities.

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\* Please see Attachment 1 – Transcribed Flip Chart Notes for key points/follow up actions recorded during the committee discussion.

- Multiple demonstrations were used to test and evaluate advancement of ASCEM capabilities in Phase II, including establishing baseline predictions for the amount of technetium-99 in the deep vadose zone at the BC Cribs in the Hanford Central Plateau.

#### *Regulator perspective*

Dib Goswami, Ecology, said these types of efforts are important in order to determine possible remediation approaches and to understand how contaminants migrate, especially when factors are not well understood. He noted that a number of studies, especially related to innovative technologies, are lagging behind expectations in the TPA milestones largely due to funding gaps and sequestration effects. Information from these studies is critical for the RI/FS process. He encouraged Board members to emphasize to DOE how critical these types of studies are to better understand the Hanford Site and develop thoughtful remediation approaches. Actually implementing remediation approaches and taking action is also important. The BC Cribs is an example of a high-tech solution being developed for a problem that can be applied in other areas for immediate improvements to groundwater. Sometimes immediate action can be taken without knowing a lot of the details.

#### *Committee discussion*

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C. DOE-Headquarters is tremendously supportive of ASCEM and continues to fund the project despite tight budgets.

*R. [PNNL] The program was shut down for a few months due to sequestration and will not be receiving the entire funding amount that was expected for the year. The code is still scheduled to be released in September but the initially planned workshops will not occur next year due to lack of funding.*

C. Development of ASCEM is encouraging. However, the approach is not well-timed and is not able to address the groundwater problems in the Central Plateau. A complicated model will be required to consider all the various components. ASCEM appears to be an interface to connect with other models.

*R. [PNNL] There is a distinction between a simulator and a model. It can be very easy to build a bad model. ASCEM uses the Akuna tool which can work with any simulator as long as the coding is done properly to read the input and output files. Integration between Akuna and Amanzi is much tighter than with other modeling/simulators so there will be more consistency across all DOE sites.*

Q. When will ASCEM be applied in the field?



*R. [PNNL] Public release of the beta version is expected to occur in late August or early September 2013. PNNL is always seeking feedback; there is a user steering committee that includes people from the Hanford Site. The ASCEM team anticipates working with Washington River Protection Solutions (WRPS) on tank farms in the next fiscal year.*

C. The most valuable part of the system is the ability to analyze what-if scenarios and the remediation alternatives to determine which approach is the most beneficial. This can be a very time consuming process.

*R. [PNNL] Assumptions always need to be made when using any tool. The benefit of using a tool in parallel is that it can be run on more than one process to obtain results faster.*

RAP will continue following this topic but did not identify any immediate action items. PNNL offered to provide another briefing after ASCEM is released to the public and they receive some feedback from end users, likely around April 2014.

### **Briefing on 340 Vault\***

#### *Agency presentation*

Tom Teynor, DOE-RL, provided an update on the 340 Building vault contamination (Attachment 5). Tom noted the following points in his presentation:

- There has been significant cleanup process in the 300 Area but significant challenges remain, including the 340 Vault.
- The 340 Vault is below-grade. It contains two 15,000 gallon stainless steel tanks that have been grouted in preparation for disposal. The vault was excavated in August 2012.
- Higher levels of contaminated soil were discovered when workers were installing the final segment of four casings that were being used to support the vault in preparation for lifting. Radiation readings were immediately detected and work was safely stopped.
- Efforts are now focused on sampling instead of preparing the vault for shipment. Results of sampling show that the peak dose rate is 17.5 R/hr at the center of the plume. There is less than 1 mR/hr at five feet below the peak contamination. The highest level of groundwater is approximately ten feet below the vault.
- The contractor has submitted a revised Final Hazard Categorization to DOE. Upon approval, excavation will continue to address contamination under the vault.

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\* Please see Attachment 1 – Transcribed Flip Chart Notes for key points/follow up actions recorded during the committee discussion.

### *Agency perspectives*

Larry Gadbois, EPA, said the dose rate found at the 340 Vault is hundreds of times less than what was found under 324 Building and the volume of contaminated material is much smaller as well. He said these types of dose rates have been dealt with using open excavation before and are within the realm of procedures that have already been completed, although caution is always required.

*R. [DOE] Protection of the environment and protection of workers is critically important. Design of the transport mechanism will include protection against any type of leakage, similar to using a cookie sheet under lasagna to catch any spill-over while baking. DOE is using lessons learned from the 324 Building.*

### *Committee discussion*

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C. Has DOE completely removed the casing where the contaminated soil was found?

*R. [DOE] Most of the soil is still mixed in with that casing. Each of the other three casings have been completed.*

*R. [WCH] Washington Closure Hanford (WCH) had almost completed placement of the fourth casing when the contamination was detected. Material was just beginning to come out when operations were shut down. Removing the contaminated soil will involve starting up the auger again with appropriate protection for workers. The patch of contamination is only about five feet across and two feet deep; it is the size of a bathtub.*

RAP will continue tracking the topic as needed but did not identify any immediate action items. They thanked DOE and WCH for the update.

### **Committee Business\***

#### *Review and confirm RAP-related topics in the proposed 2014 HAB Work Plan*

The committee reviewed the proposed 2014 HAB Work Plan, focusing on the topics identified for RAP (Attachment 6). The proposed draft work plan was developed during the Executive Issues Committee (EIC) leadership retreat and brought to the June Board meeting. Hillary Johnson, EnviroIssues, noted that official agency input on the work plan has not been received yet and today's discussion is to check in the

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committee on the RAP-related topics. With the agency work plan items to come and further refinement by the EIC, there is likely more work to be on the proposed draft work plan before it is brought forward for adoption at the September Board meeting.

Kim Ballinger, DOE-RL, provided a draft DOE-RL and DOE-ORP work planning list for HAB (Attachment 7). She said this document is a good working draft at a policy level.

The committee added a number of additional topics, considered the policy-level issues, and discussed potential HAB action. Major points of discussion include:

- RAP would like to discuss the trench cleanup at 618-10 that is expected to be complete in 2014, as well as the continual cleanup efforts for the TRU drums and start of the vertical pipe units (VPUs). EPA noted that interim actions have already been decided and the proposed final action is the same. DOE-RL did include 618-10 as a priority issue in the informal work planning list. There is some ongoing work to recover six drums that were buried at ERDF and additional retrieval work will continue into July/August. DOE confirmed that work on the VPUs will begin next year but that no VPU work has begun yet. RAP would like an update on these efforts around the September timeframe.
- There are several OUs scheduled to be released in 2014 that RAP would like to review with the possibility of advice development, including BC, 100-K, F, N, D-H, 300, and Orchards. These OUs are scheduled to be released over the next three years. RAP will focus on the Proposed Plans as the policy level issue.
- RAP has been asked to discuss emergency preparedness but has not considered how to address the topic. Emergency preparedness would be a joint topic with the Health, Safety, and Environmental Protection Committee (HSEP). DOE is holding a drill in August and suggested that interested HAB members may be able to observe. September might be appropriate for addressing emergency preparedness so DOE can update the Board about results of the August drill.
- Groundwater treatment encompasses the 100 and 200 Areas. While 200 Area is important, the pump and treat in 100 Area also deserves attention. RAP would like to ensure these efforts continue and remain a budget priority.
- Committee members suggested holding discussions about possibly re-defining high level waste, TRU and other waste distinctions. This topic would be joint with the Tank Waste and Public Involvement committees.

#### *Update the 3-month work plan*

The committee updated the 3 month work plan (Attachment 8). Topics identified for a possible August committee meeting include: the draft RI/FS work plan for the BC Cribs, a follow up conversation on the groundwater modeling topic, discussion of the RI/FS and Proposed Plan Draft A for 100 N, and a continuation of the Board 2014 work plan discussion (if needed). EPA suggested that the 100 N topic will

require quite a bit of time discussion and likely follow up in September. In September, RAP also proposed continuing the discussion of vadose zone technologies with PNNL and hearing an update on the K Reactor Boreholes.

#### *Update Issue Manager table*

RAP briefly discussed the Issue Manger table (Attachment 9). Committee members were asked to review the table and provide any updates to Hillary. She will send an updated table to the entire committee and post it to SharePoint.

### **Attachments**

Attachment 1: Transcribed Flip Chart Notes

Attachment 2: Pre-Hanford Orchard Lands

Attachment 3: DOE-RL Update K Basins Sludge Treatment Project

Attachment 4: ASCEM Current Status and Hanford Phase II Demonstration Results

Attachment 5: Update on 340 Building Vault Contamination

Attachment 6: HAB FY2014 Work Plan

Attachment 7: Draft ORP and RL FY 14 Work Planning List for HAB

Attachment 8: River and Plateau Committee – 3 Month Work Plan

Attachment 9: River and Plateau Committee FY 2014 Issues Table

### **Attendees**

Board members and alternates

Shelley Cimon	Dale Engstrom	Maynard Plahuta
Barbara Harper	Gary Garnant	Dick Smith
John Howieson (phone)	Pam Larsen	Bob Suyama
Steve Hudson (phone)	Susan Leckband	Gene Van Liew

Others

Kim Ballinger, DOE-RL	Dib Goswami, Ecology	Bruce Ford, CHPRC
J.D. Dowell, DOE-RL	Nina Menard, Ecology	Nicole Addington, EnviroIssues
Roger Quintero, DOE-RL	Larry Gadbois, EPA	Hillary Johnson, EnviroIssues
John Sands, DOE-RL	Chris Guzzetti, EPA	Michael Turner, MSA
Tom Teynor, DOE-RL	Emy Laija, EPA (phone)	Amoret Bunn, PNNL
	Rod Lobos, EPA	Vicky Freedman, PNNL
		Tom Rodgers, WA-DOH
		Peter Bengtson, WCH

		Don McBride, WCH
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